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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER	
MICHALSKI, JUSTIN I	
ART UNIT	**PAPER NUMBER**
2644	7

DATE MAILED: 08/11/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/781,276	OHTA, YOSHIKI	
	Examiner	Art Unit	
	Justin Michalski	2644	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *24 May 2004*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-24* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-24* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.

4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .

5) ☐ Notice of Informal Patent Application (PTO-152)

6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1, 2, 4, and 8 are rejected under 35 U.S.C. 102(b) as being anticipated by Plunkett (US Patent 5,386,478).

Regarding Claim 1, Plunkett discloses an automatic sound field correcting system (Figure 1) in an audio system for supplying a plurality of input audio signals (outputs of source block 22) to a plurality of sound generating means (speakers 14) via a plurality of signal transmission lines (lines from control modules 24 to speakers 14), each of the plurality of signal transmission lines including an equalizer for adjusting a frequency characteristic of the audio signal (modules 24 contain circuitry for equalization) (Column 2, lines 36-41), a channel-to-channel level adjusting means for adjusting a level of the audio signal (Plunkett discloses balance adjustment, i.e. channel-to-channel level adjustor, in modules 24) (Column 3, lines 49-52), and a delaying means for adjusting a delay time of the audio signal (Figure 2, delay module 40), so that the input audio signals are supplied to said sound generating means via said equalizers, said channel-to-channel level adjusting means, and said delaying means, said correcting system comprising: a noise generating means for supplying a noise to

respective signal transmission lines independently correcting a sound field (Plunkett discloses test signals (i.e. noise) to each loudspeaker) (Column 3, lines 28-30); detecting means for detecting reproduced sounds of the noise reproduced by said sound generating means (microphone 36); channel-to-channel level correcting means for correcting an adjusted amount of said plurality of channel-to-channel level adjusting means based on the detection results of said detecting means (Plunkett discloses balance adjustment (i.e. channel-to-channel adjustors) in modules 24) (Column 3, lines 51-52); and phase characteristic correcting means for calculating phase characteristics of the reproduced sounds reproduced by said sound generating means based on the detection results of said detecting means and also correcting delay time of said delaying means based on calculated phase characteristics (Plunkett discloses delay balance (i.e. phase corrector) based on results from microphone 36) (Column 4, lines 5-16).

Regarding Claim 2, Plunkett further discloses a controlling means (remote control unit 34) for causing said channel-to-channel level correcting means (module 24) to correct and adjusted amount of said channel-to-channel level adjusting means and causing said phase characteristic correcting means (module 24) to correct the delay time of said delaying means, after causing said frequency characteristic correcting means to correct the adjusted amount of said equalizers.

Regarding Claim 4, Plunkett further discloses said channel-to-channel level correcting means corrects respective adjusted amounts of said plurality of

channel-to-channel level adjusting means such that levels of reproduced sounds reproduced by said plurality of sound generating means is made substantially equal over a full audio frequency band (Plunkett discloses any unbalance (i.e. over full frequency band) is corrected) (Column 3, lines 49-52).

Regarding Claim 8, Plunkett further discloses a device as stated apropos of claim 1 including said phase characteristic correcting means (remote control unit 34 and module 24) calculates phase characteristics of the reproduced sounds based on detection results of said detecting means (microphone 34) by a correlation calculating approach (Column 4, lines 5-16).

Regarding Claim 13, Plunkett discloses an automatic sound field correcting system (Figure 1, reference 18) in an audio system which supplies a plurality of input audio signals (outputs of source block 22) to a plurality of sound generators (speaker 14) via a plurality of signal transmission lines (lines from control modules 24 to speakers 14) each comprising an equalizer (modules 24 contain circuitry for equalization) (Col. 2, lines 36-41), a channel-to-channel attenuator (Plunkett discloses balance adjustment, i.e. channel-to-channel level adjustor in modules 24) (Col. 3, lines 49-52), and a delay circuit (Figure 2, delay module 40), said sound field correcting system comprising: a noise generator which independently supplies a noise signal to respective signal transmission lines (Plunkett discloses test signals (i.e. noise) to each loudspeaker) (Col. 3, lines 28-30); a sound detection circuit which detects sounds of noise signals reproduced by said sound generators (microphone 36); a frequency characteristic correcting circuit which corrects frequency characteristics of said

equalizer of each of said signal transmission lines based on a detection result of said sound detection circuit (Plunkett discloses equalization in modules 24) (Col. 2, lines 36-39); a channel-to-channel level correcting circuit which corrects an adjusted amount of said channel-to-channel attenuator of each of said signal transmission lines based on the detection result of said sound detecting circuit (Plunkett discloses balance adjustment (i.e. channel-to-channel adjustors) in modules 24) (Column 3, lines 51-52); and a phase characteristic correcting circuit which calculates phase characteristics of the reproduced sounds reproduced by said sound generators based on the detection results of said sound detecting circuit, said phase characteristic correcting circuit correcting delay times of said delay circuit of each of said signal transmission lines based on said calculated phase characteristics (Plunkett discloses delay balance (i.e. phase corrector) based on results from microphone 36) (Column 4, lines 5-16).

Regarding Claim 14, Plunkett further discloses a control circuit (remote control unit 34) which controls said channel-to-channel level correcting circuit (module 24) to correct said adjusted amount of said channel-to-channel attenuator of each of said signal transmission lines, and controls said phase characteristic correcting circuit (module 24) to correct the delay times of said delay circuit of each of said signal transmission lines, after controlling said frequency characteristics correcting circuit to correct the adjusted amount of said equalizer of each of said signal transmission lines.

Regarding Claim 16, Plunkett further discloses said channel-to-channel level correcting circuit corrects respective adjusted amounts of said channel-to-

channel attenuator of each of said signal transmission lines such that levels of reproduced sounds reproduced by said plurality of sound generators is made substantially equal over a full audio frequency band (Plunkett discloses any unbalance (i.e. over full frequency band) is corrected) (Col. 3, lines 49-52).

Regarding Claim 20, Plunkett further discloses a system as stated apropos of claim 13 above including a phase characteristic correcting circuit (remote control unit 34 and module 24) calculates phase characteristics of the reproduced sounds based on detection results of said sound detection circuit (microphone 34) by a correlation calculating approach (Col. 4, lines 5-16).

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Plunkett as applied to claim 1 above in view of Koyama et al. (US Patent 5,581,621).

Regarding Claim 3, Plunkett discloses a system as stated apropos of claim 1 above but does not disclose the use of pink noise. Koyama et al. discloses an automatic adjustment system of an audio device using pink noise (Column 30, line 67). Koyama et al. discloses that the noise is received by the

microphone and analyzed by unit 60 which determines the signal level in each of the frequency bands covering the audio frequency spectrum. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use pink noise in order to measure and analyze the response of all frequency bands at the same time in order to obtain a more efficient adjustment method.

5. Claim 15 is rejected under 35 U.S.C. 103(a) as being unpatentable over Plunkett as applied to claim 13 above in view of Koyama et al. (US Patent 5,581,621). Plunkett discloses a system as stated apropos of claim 13 above but does not disclose the use of pink noise. Koyama et al. discloses an automatic adjustment system of an audio device using pink noise (Column 30, line 67). Koyama et al. discloses that the noise is received by the microphone and analyzed by unit 60 which determines the signal level in each of the frequency bands covering the audio frequency spectrum. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use pink noise in order to measure and analyze the response of all frequency bands at the same time in order to obtain a more efficient adjustment method.

6. Claims 5-7, 9-12, 17-19, and 21-24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Plunkett in view of Koyama et al. (US Patent 5,581,621).

Regarding Claims 5 and 17, Plunkett discloses an automatic sound field correcting system in an audio system for supplying a plurality of input audio signals (Figure 1, outputs of source block 22) to all frequency band sound generating means (speakers 14) via a plurality of signal transmission lines (lines from control modules 24 to speakers 14), each of the plurality of signal transmission lines including an equalizer (modules 24 contain circuitry for equalization) (Column 2, lines 36-41) for adjusting a frequency characteristic of the audio signal, a channel-to-channel level adjusting means for adjusting a level of the audio signal (balance adjustment circuitry in modules 24) (Column 3, lines 49-52), and a delaying means (delay unit 40) for adjusting a delay time of the audio signal, so that the input audio signals are supplied to said sound generating means via said equalizers, said channel-to-channel level adjusting means, and said delaying means, said correcting system comprising: a noise generating means (Plunkett discloses test signals (i.e. noise) to each loudspeaker) (Column 3, lines 28-30) for supplying a noise to said respective signal transmission lines independently in correcting a sound field; detecting means (Microphone 36) for detecting reproduced sounds of the noise reproduced by said sound generating means; frequency characteristic correcting means (separately controllable frequency bands) (Paragraph bridging columns 3 and 4) for correcting frequency characteristics of said equalizers based on detection results of said detecting means; first and second channel-to-channel level correctors (i.e. balance adjustment) (Column 3, lines 51-52) for correcting an adjusted amount of the plurality of channel-to-channel level adjustors (modules

24) of the signal transmission lines, in which the all-frequency band sound generator are provided, out of said plurality of channel-to-channel level adjusting means based on the detection results of said detecting means (microphone 34); phase characteristic correcting means for calculating phase characteristics of the reproduced sounds reproduced by respective sound generating means based on the detection results of said detecting means and also correcting delay times of said delaying means based on calculated phase characteristics (Plunkett discloses delay balance (i.e. phase corrector) based on results from microphone 36) (Column 4, lines 5-16).

Although Plunkett discloses a plurality of signal transmission lines and generators, Plunkett does not disclose a low frequency band exclusively reproducing sound generator. Koyama et al. discloses an automatic adjustment system of an audio device (Figure 1) comprising a low frequency band exclusively reproducing sound generator (Figure 2, converter 26 and signal 2a for subwoofer). Therefore, it would have been obvious to one or ordinary skill in the art at the time the invention was made to include a low frequency sound generator along with other channels in order to obtain a more high fidelity audio output from the system (Col. 3, lines 25-39).

Regarding Claims 6 and 18, Plunkett further discloses controlling means (remote control 34, command module 28, and control modules 24) for causing said first channel-to-channel level correcting means to perform the correction (first module 24), then causing said phase characteristic correcting means for

perform the correction (delay unit 40), and then causing said second channel-to-channel level correcting means (second module 24) to perform the correction after causing said frequency characteristic correcting means to perform the correction (Column 3, lines 51-52).

Regarding Claims 7 and 19, Plunkett further discloses an adjusted amount of the plurality of channel-to-channel level adjusting means (balance adjustor 24) are corrected such that a spectrum average level of the reproduced sounds reproduced by the plurality of sound generating means are made flat over all audio frequency bands (Plunkett discloses any unbalance (i.e. over full frequency range) is corrected) (Column 3, lines 49-52).

Regarding Claims 9 and 21, Plunkett discloses a sound field correcting method in an audio system including a plurality of input audio signals (Figure 1, outputs of source block 22) separately to all frequency band sound generating means (speakers 14), each of the plurality of signal transmission lines including a equalizer for adjusting a frequency characteristic of the audio signal (modules 24 contain circuitry for equalization) (Column 2, lines 36-41), a channel-to-channel level adjusting means for adjusting a level of the audio signal (Plunkett discloses balance adjustment, i.e. channel-to-channel level adjustor) (Column 3, lines 49-52), and a delaying means for adjusting a delay time of the audio signal, so that the input audio signals are supplied to said sound generating means via said equalizers (delay unit 40), said channel-to-channel level adjusting means, and

said delaying means, said method comprising: a first step of measuring reproduced sounds (microphone 36) reproduced by said all frequency band sound generating means (speakers 14) by inputting a noise (Plunkett discloses a test signal (i.e. noise) (Column 3, line 28), and then correcting frequency characteristics of said equalizers based on measured results (Plunkett discloses separately controllable frequency bands as a function of the test signal) (Paragraph bridging columns 3 and 4); a second step of measuring the reproduced sounds reproduced by said all frequency band sound generating means by inputting the noise (Plunkett discloses a test signal (i.e. noise) (Column 3, line 28), and then correcting an adjusted amount of said channel-to-channel level adjusting means for said all frequency band sound generating means based on the measured results (Plunkett discloses balance adjustment (i.e. channel-to-channel adjustment) of amplifiers in modules 24 (Column 3, lines 51-52); a third step of measuring the reproduced sounds reproduced by said all frequency band sound generating means by inputting the noise (Plunkett discloses a test signal (i.e. noise) (Column 3, line 28), and then correcting delay time of said delaying means based on the measured results (delay introduced to compensate for longer signal) (Column 4, lines 5-16); a fourth step of measuring independently reproduced sounds reproduced by said all frequency band sounds generating means (microphone 36); a fifth step of correcting an adjusted amount of said channel-to-channel level adjusting means based on measured results measured by the fourth step (Plunkett discloses balance adjustment, i.e. channel-to-channel level adjustor, in modules 24) (Column 3, lines 49-52). Plunkett does not

disclose a low frequency band exclusively reproducing sound generator and using an average level in step five for frequency adjustment. Koyama et al. discloses an automatic adjustment system of an audio device (Figure 1) comprising a low frequency band exclusively reproducing sound generator (Figure 2, converter 26 and signal 2a for subwoofer). Koyama et al. further discloses a method of making an automatic adjustment to a parameter of an audio system based on an average level of a low band frequency response (Column 24, lines 54-59). Although the adjustment is made based on an average of a frequency response rather than an average time detection result, it would have been obvious to one skilled in the art at the time the invention was made to analyze and make an adjustment based on an average of several values as disclosed by Koyama et al. automatically making an adjustment to enhance the output of an audio system. Therefore, it would have been obvious to one or ordinary skill in the art at the time the invention was made to include a low frequency sound generator along with other channels in order to obtain a more high fidelity audio output from the system and to include a low frequency sound generator along with other channels in order to obtain a more high fidelity audio output from the system.

Regarding Claims 10 and 22, Plunkett further discloses steps are repeated plural times (Plunkett discloses command module can deliver test signals to each loudspeaker (i.e. plural) (Column 3, lines 28-30), and then the frequency characteristics of the equalizers are corrected based on plural times

measured results (frequency is adjusted based on test (i.e. noise) signal) (Paragraph bridging columns 3 and 4).

Regarding Claims 11 and 23, Plunkett further discloses steps are repeated plural times (Plunkett discloses command module can deliver test signals to each loudspeaker (i.e. plural) (Column 3, lines 28-30), and adjusted amount of channel-to-channel level adjusting means is corrected based on plural times measured results (Plunkett discloses balance adjustment, i.e. channel-to-channel level adjustor) (Column 3, lines 49-52).

Regarding Claims 12 and 24, Plunkett discloses a method as stated apropos of claim 9 and 21 respectively but does not disclose adjusting the frequency discriminating means previously by using a target curve data. Koyama et al. discloses an automatic adjustment system and method for and audio device. Koyama et al. discloses a method (Figure 4) of adjusting an audio device where frequency discriminating means are adjusted previously using previous target data (step S2 discloses loading current (i.e. previous) data from the DSP and backup) (Column 15, lines 59-67). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to include previous target data to load a preexisting setting or use a backed up setting as disclosed by Koyama et al. in order to produce a more reliable automatic adjustment.

Terminal Disclaimer

7. The terminal disclaimer filed on 24 May 2004 disclaiming the terminal portion of any patent granted on this application which would extend beyond the expiration date of any patent granted on Application Number 09/781,277 has been reviewed and is accepted. The terminal disclaimer has been recorded.

Response to Arguments

8. Applicant's arguments filed 24 May 2004 have been fully considered but they are not persuasive. The applicant argues, page 17, that Plunkett does not disclose, teach or suggest an audio system, or method, where frequency characteristic correction of equalizers is performed with correction of adjusted amount a plurality of channel-to-channel level adjustors. The Office respectively disagrees. Plunkett clearly discloses a plurality of channel-to-channel level adjustors (gain controlled amplifiers in modules 24L and 24R) where frequency characteristics correction is also performed (Plunkett discloses modules 24L and 24R contain equalization circuitry, Col 2, lines 36-38).

Conclusion

9. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory

action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Justin Michalski whose telephone number is (703)305-5598. The examiner can normally be reached on 8 Hours, 5 day/week.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Bill Isen can be reached on (703)305-4386. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

FORESTER W. ISEN
SUPERVISORY PATENT EXAMINER

JIM